1. Write structural formulas for the following compounds.
   2-ethoxyoctane  divinyl ether  allyl methyl ether

2. Give common names for the following compounds.
   \((\text{CH}_3)_2\text{CH-O-CH(\text{CH}_3)\text{CH}_2\text{CH}_3}\)  \((\text{CH}_3)_3\text{C-O-CH}_2\text{CH}_2\text{CH(\text{CH}_3)_2}\)

3. Give IUPAC names for the following compounds

4. Show how you would synthesize the following ethers in good yield from the indicated starting materials and any other reagents needed.
   a) 1-methoxydecane from a decene
   b) 2-methoxydecane from a decene
   c) n-butyl phenyl ether from phenol and 1-bromobutane
5. Write the mechanism and predict the products of the following reactions.
   a) Potassium t-butoxide + sec-butylbromide

   b) Sec-butyl isopropyl ether + conc HBr, heat